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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application

Alfred Johann Peter HASZLER et al — Art Unit: 1742

Serial No.: 09/830,448 — Examiner: J. Combs-Morillo

Filed: July 30, 2001

For: COMPOSITE ALUMINUM PANEL

## RULE 132 DECLARATION

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

I Adrianus Petrus Vloemans declare as follows:

1. I am currently employed as a Researcher by Corus Technology BV at its research laboratories in IJmuiden, The Netherlands and have been employed by this company since 1997. I am currently working in the field of Product Applications, and in particular Construction, Shipbuilding and Automotive applications.

2. I have an engineering degree from the Technical University of Eindhoven, NL (1994), and finished a post-master in August 1996 in Industrial Design Engineering from the Technical University of Delft, NL.

3. I have published the following:

A.P. Vloemans, N.F.M. Roozenburg and A.J.F. Kersten, *Evaluating the Systematic Design Approach of Unilever's Advanced Manufacturing Technology Group*, 11th International Conference On Engineering Design, 1997, Tampere, Finland.

A.P. Vloemans, R.W. Ruifrok, A. Waaijer, S. Prinsen, *Best of Both Metals in Body Parts – Light Weight Concepts for a Bonnet*, International Body Engineering Conference, 1999, Detroit, USA.

A.P. Vloemans, D. Sampath, A. Haszler, *Alustar Alloy AA5059: A Better Alternative to AA5083 in Lightweight Constructions*, Royal Institute of Naval Architects Conference, 2000, London, UK.

A.P. Vloemans, D. Sampath, K. Mechsner, *Alustar Alloy AA5059: A Better Alternative to AA5083 in The Marine Industry*, The Fourth International Forum on Aluminium Ships, 2000, New Orleans, USA.

A.P. Vloemans, S. Desikan, A. Haszler, *Engineered Innovative Marine Products from Corus Aluminium Walzprodukte GmbH*, Ausmarine 2000 Conference, Fremantle, Australia.

A.P. Vloemans, S. Desikan, K. Mechsner, *Engineering Applications of CORALDEC™ Panels from Corus Aluminium Walzprodukte GmbH*, Aluminium 2000, Essen, Germany.

4. I am familiar with the above-identified application and the Office action of June 16, 2003, cited against this application as well as the references EP 799,900, U.S. Patent No. 3,685,229 to Sale, Jr. et al. and "Metals Handbook Desk Edition" pp. 445, 450, cited in this Office action. I understand Claim 1, and other independent claims, will be amended to recite its corrugated aluminium stiffener sheet has a thickness in the range of up to 3.0 mm.

5. Claims 1, 2, 5, 6, 8, 10-25, 27, 28, and 31-34 are rejected under 35 USC § 103 as being unpatentable over EP '900 in view of Sale, Jr. et al. and optionally "Metals Handbook Desk Edition" pp. 445, 450. The Office action asserts EP '900 does not teach:

(a) the PS/UTS ratio in the H or O temper of the alloy; or

(b) the recited alloy is corrugated and secured to a parallel plate or sheet.

6. The Office action asserts "where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established" to make up for deficiency (a). The Office action cites Sale, Jr. et al. to make up for deficiency (b). Sale, Jr. et al. does not disclose any

specific composition, other than a general mention that "steel, aluminium, etc." would be a suitable material (See, Sale, Jr. et al, column 4, lines 4-31).

7. There is no motivation from EP '900 combined with Sale, Jr. et al. to select the alloy of EP '900 from the vast group of "any suitable material such as steel, aluminum, etc." listed by Sale, Jr. et al. because it is unpredictable that the rolled alloy of EP '900, when converted to a 3.0 mm thick corrugated aluminium stiffener sheet according to the present invention, would be suitable for the claimed composite product. Although EP '900 discloses its plates have some good properties, these properties do not motivate the selection because it is unpredictable that these good properties would translate to a good corrugated 3.0 mm thick roll formed corrugated aluminium stiffener sheet. In particular, it would be unpredictable and unexpected that a 3.0 mm thick corrugated sheet of the alloy would be sufficiently strong to have a ratio of PS/UTS in the range of 0.4 to 0.9 in an H- or O-condition and have good roll formability and be weldable as recited by Claim 1. Claims to composite panel including a welded corrugated stiffener sheet having thickness in the range of 0.2 to 1.0 mm further distinguish over the references because it is further unpredictable that the EP '900 rolled alloy product would be suitable for this product. This highlights the unexpected advantage of producing a lighter weight composite panel.

8. Present Claim 1 recites the stiffener sheet is attached to two parallel plates or sheets by welding. For safety reasons it is important to know the mechanical properties after welding, in particular the yield strength. It is especially useful to know the properties after using $CO_2$ and/or Nd-YAG laser welding because these are the welding techniques preferably used by the applicant in manufacturing welded composite panels. As stated at page 14, lines 1-9 of the present application, Table 2 presents tensile properties for samples with weld beads produced from "through welded" sheets welded using a $CO_2$ laser.

9. For the light-weight constructions according to Det Norske Veritas (DNV) an important design criteria is the f1 defined as: yield strength (MPa)/240. The higher the f1 the thinner the gauges which may be used and, consequently, this leads to lighter

weight structures. A design engineer would make these calculations both for the non-welded and the welded yield strength, and would take the value safest for the design for the relevant part, and which is commonly the value of the yield strength in the welded condition.

10. Moreover, an alloy having sufficient strength might not have sufficiently good roll formability. As explained at page 1 of the present application, the alloys must be capable of being roll formed. The claim 1 term "good roll formability" is taken to be "good bendability" defined as passing ASTM E-290 as explained at page 13 of the present specification. The alloy has good bendability so it can form the corrugated sheet without cracking.

11. A wide variety of aluminium alloys can be roll-formed. However, an issue is whether they be can roll formed easily enough to be practical. For example, if a user has an existing roll-forming apparatus with ten rolls and the alloy is sufficiently difficult to roll form that it requires 20 rollers to achieve respectively small bending steps, then it may be impractical to use the alloy because the user may have to purchase additional rollers.

12. The fact that plate alloys are not necessarily good corrugated sheet alloys is also shown by AA5083. EP '900, page 2, lines 14-24 mentions AA5083 alloy plates are used in construction of marine vessels because it provides the best available combinations of high strength, light weight, corrosion resistance, bendability, formability and weldability. However, AA5083 is not known to be useful for roll forming a thin corrugated sheet for use in composite panels for marine vessels.

13. EP '900, Table 2, discloses ASSET and weight loss corrosion resistance data for its rolled products in the non-welded condition. (In EP '900, Table 2, sample A1, is AA5083 alloy.) When the present welded composite panels are to be used in a marine environment, which is a most preferred application of the claimed composite panel, the corrosion performance after forming, e.g., via roll forming, and after laser welding is sufficiently unpredictable that it would have to be determined before selling the product in the form of a composite panel as described in present Claim 1. Those skilled in the

art would not rely merely on data from EP '900 relating to non-welded alloys before selling the present different shape and thickness product.

14. Thus, EP '900 does not provide enough information to teach its alloys would be suitable for Roll Forming corrugated structures of the present invention; and Sale, Jr. et al.'s teaching of "steel, aluminum, etc." is too broad to provide any guidance to select the alloys of EP '900.

15. Moreover, this selection of the presently claimed alloy for the corrugated aluminium stiffener sheet achieves unexpected results over the industry standard material (AA3004) for such sheet as shown by data in the present application at pages 13-15 of the present specification. The present application at page 1, last full paragraph, asserts the standard alloy for corrugated sheets is AA3004. Since Sale, Jr. et al does not specifically list an alloy and the alloys of EP '900 are only presented as non-welded rolled products. There is no way to reasonably compare the corrugated sheets of the present invention with the alloys of Sale, Jr. et al. or the rolled products of EP '900. Thus, a better comparison is to compare the corrugated sheets of the present invention with industry standard corrugated sheets and this is what the Examples of the present specification compare.

16. Also, the Assignee CORUS ALUMINIUM WALZPRODUKTE GMBH has brought on the market laser welded panels having the construction and composition subject of the pending claims under the trademark CORALDEC. A copy of information on this may be downloaded from the website:

www.corusgroup-koblenz.com/english/products/shipbuilding/coraldec/inhalt.htm

A copy of this downloaded information is attached (ATTACHMENT I). These composite panels use Assignee's ALUSTAR-alloy (both as the corrugated sheet and for the parallel plates) falling within the present claims and have been employed commercially in a large 90 m long sailing ship build by Royal Huisman Shipyard in the Netherlands (see also the above mentioned web-site). 52 welded decks have been constructed and used. The length of these decks were up to 4 meters, and all having a width of 0.8 meters, and all having a height of 100 mm.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

Date: 12 December 2003 By: _____

Adrianus Petrus Vloemans

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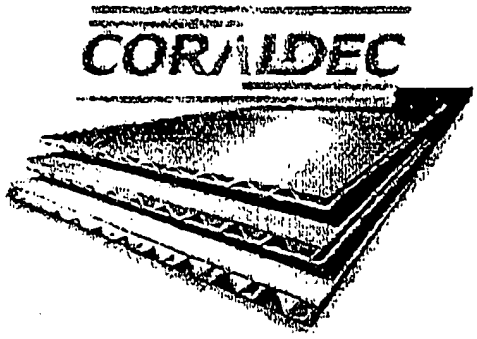
ATTACHMENT I - Printout of
www.corusgroup-koblenz.com/english/products/shipbuilding/coraldec/inhalt.htm

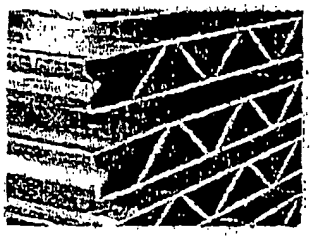
# A lightweight aluminium panel

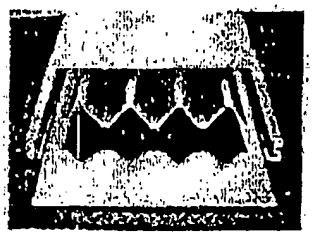



**Light sandwich-constructed plate for the shipbuilding sector**

Coraldec is a versatile composite plate for the shipbuilding industry which has been further developed by Corus Aluminium Walzprodukte.

Coraldec is a laser-welded and pre-fabricated sandwich-constructed plate using Alustar AA5059 alloy. Coraldec consists of a specially formed, corrugated sheet, that is lined with an upper and lower layer of flat laser-welded sheet. This provides a sturdy, thick, yet light panel - plate. It can be used, for instance, for planking for ship decks, and for many other areas of application; and it fulfills all current safety requirements and standards.





**Characteristics**

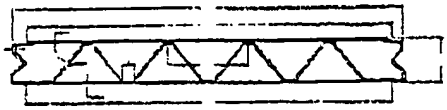
- Assembled from flat and corrugated sheets
- Joining by laser welding or adhesive bonding
- Prefabricated custom-made panel
- (Corrugated) sheet produced with Alustar alloy AA5059 a.o.
- Up to 30 % weight saving

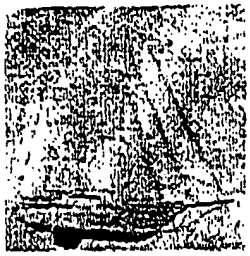
**Applications**

- Decks in fast ferry catamarans
- Decks in the superstructure of cruise ships
- Decks in aluminium super yachts
- Walls of dump trucks, ships and others

**Commercial application of Coraldec**

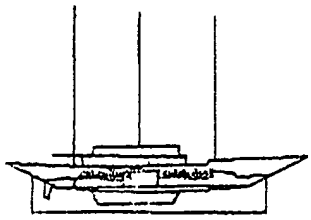
Cabin decks in the "Athena" 90 m 3-mast schooner, currently under construction at Royal Huisman Shipyard, The Netherlands





**Requirements and Advantages**

- IMO A0 fire safety
- Flatness
- Panel height
- Stiffness
- Weight Saving



**Coraldec in production**

Corrugated sheet

Coraldec before welding

Laserwelding by Meyer Werft

End product